15,000RPM enterprise hard drives

Hitachi Ultrastar™ 15K300 Resource Guide

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Hitachi Ultrastar 15K300 enterprise hard drives

15,000RPM (15K) hard drives are rapidly becoming the drives of choice for mission-critical enterprise computing environments such as Online Transaction Processing (OLTP). The major players in the server manufacturing industry are leading the way, but this shift also represents an excellent opportunity for systems builders aware of the potential gains.

So what are the advantages of 15K drives over their 10,000RPM (10K) equivalents? How can Hitachi help you embrace this new technology? And what about compatibility with other components? This Resource Guide has been designed to provide you with all the information you need, from both business and technical perspectives.

So why should you read this guide?

- Find out about 15K drives and the benefits they offer
- Gain an understanding of current market trends and the opportunities they represent
- Read up on the Ultrastar 15K300's technical applications, and where it is most relevant
- Discover the benefits of working with Hitachi and find out about our Design Studios
- Use the compatibility guide to see how you can start integrating 15K devices today

Down to business

15K drives – the opportunity
The emergence of 15K hard drives has created a wealth of new market opportunities for systems builders. Until recently, many systems builders have continued to use traditional 10K hard drives within their servers, primarily for financial reasons. However, as the performance benefits of 15K hard drives become increasingly apparent, more and more systems builders are recognising the potential they offer.

Your customers need performance to improve their productivity, and reliability to protect their user data and reduce their total cost of ownership (TCO). Using 15K drives in your products, you will be able to increase sales within your existing customer base by offering a higher quality product, which delivers the required performance and reliability at a higher profit margin. Moreover, enhanced server capabilities will enable you to break into new markets, allowing you to compete in fields previously dominated by the major worldwide players.

15K drives – the market context
The ultra-fast 15K drives are designed to meet the needs of a key element within the storage hierarchy: enterprise computing environments, which primarily deal with high bandwidth applications requiring fast responses. This may translate to systems with multiple users, or systems with many small items of data stored anywhere within the disk array, or both. Think about transaction-based systems, web servers and SQL database applications. In these situations, the 24% speed increase offered by 15K drives is clearly beneficial.

Many systems builders are now looking to RAID systems to provide capacity and performance beyond that offered by single hard drives.15K drives are ideal for RAID systems as they combine optimum performance with superb reliability.

Hitachi Ultrastar 15K300 – product overview
The Ultrastar 15K300 is a 15,000RPM, 3.5 inch hard drive offering capacities of 73, 147, and 300GB – the highest traditional enterprise capacity point. It leverages the proven system architecture and electronics of the previous generation and offers SAS, SCSI and Fibre Channel interfaces, making it highly compatible with all 3.5 inch enterprise systems. It delivers the highest possible performance with mission-critical reliability, making it the ideal solution for demanding enterprise computing environments like online transaction processing, intensive data analysis and other multi-user applications.

Applications
- Online Transaction Processing (OLTP)
- High load, multi-user, multi-tasking, real-time systems

Benefits
- Blistering speed – 24% faster than standard 10K drives
- Huge capacity – up to 300GB, the highest traditional industry standard
- Complete flexibility – compatible with SAS, SCSI and FC interfaces
- Best of breed reliability

Technically speaking

Ultrastar 15K300 – the technical benefits

The Ultrastar 15K300 has been designed to meet the demands of speed-hungry enterprise environments involving online transaction processing, intensive data analysis and multi-user applications. Applications which require fast, random data access – whether in storage or server applications.

The Ultrastar 15K300 delivers 24% better IOPS performance than a standard 10K hard drive. This improvement means that the 15K drive can meet throughput requirements with fewer drives than its 10K equivalent (see Figure 1.0 below).

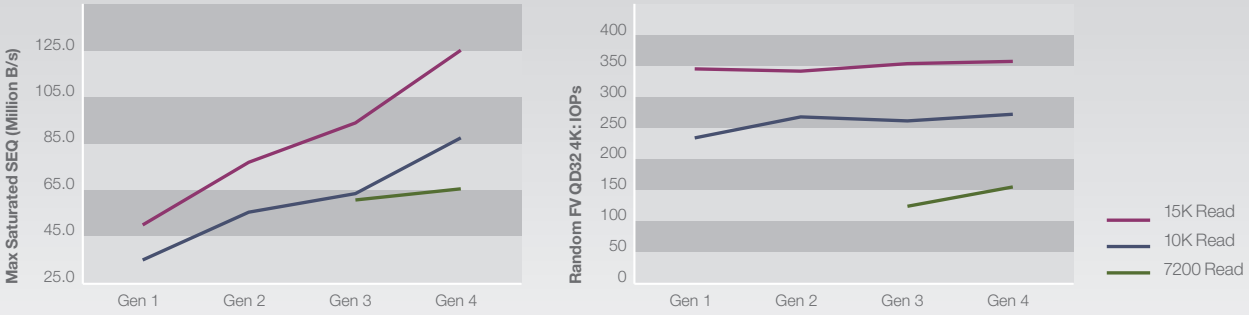
Beyond speed

As well as providing blistering speed, the 3.5 inch Ultrastar 15K300 offers:

- 73GB, 147GB and 300GB capacities for configuration flexibility
- Rotational Vibration Safeguard (RVS), ensuring performance in multi-drive systems
- 16MB cache buffer, optimizing response times and minimizing overhead command
- Ultra320 SCSI, 3Gb/s Serial-Attached CSI (SAS) and 4Gb/s Fibre Channel interfaces
- Workload detector technology to maximise performance in RAID environments
- Thermal Fly-height Control (TFC) and Adaptive formatting for improved reliability and performance
- TMR head technology, producing highly reliable high density storage
- Head load/unload ramp to minimize drive failures
- 5 year warranty, so you have full peace of mind

For more information, please refer to the compatibility tables over the page.

Figure 1.0: 15K performance in arrays



Why Hitachi?

Hitachi Design Studios
At Hitachi Global Storage Technologies we realise a systems builder's task is not an easy one. So in addition to our first class hard drives with proven performance and best-of-breed reliability, we offer a complete Design Studio service for our customers. Dedicated to helping people like you get the drives you need to make your products excel, our Design Studios can help with every element of the pre- and post-sales process, ensuring total compatibility and performance.

With Design Studios in the UK, Japan, the USA, China and Taiwan, our engineers will work with you to modify your design, testing our hard drives within your prototypes.

Testing will include:

- Replication of every possible working scenario
- Extreme temperature performance
- Chassis design analysis, minimising vibration and optimising interfaces

In short, they'll put your products through their paces to ensure they deliver optimum perform-ance; they'll help you solve the problems before they occur.

What next?
For more on how our Design Studios could help you, or to access our Hitachi Ultrastar 15K300 datasheets for further technical information, visit **www.hitachigst.com**

Compatibility tables

Ultrastar 15K300 compatibility: FC distribution HBAs

	Manufacturer	Product reference
1Gb FC	Adaptec	AHAF940
	Adaptec	AHAF950
	Agilent	AFC 9110G
	ATTO	Express PCI FC
	Emulex	LP800
	HP	HHBA 5100A
	Interphase	5526 E-FS-C
	JNI	FCE2-6410-N
	JNI	FCI 1063 C1
	LSI Logic	SYM40909H
	Qlogic	2100
	Qlogic	2100/66
	Qlogic	2200/66
	VMIC	5661 PCI
4Gb FC	ATTO	Celerity FC 41XS
	ATTO	Celerity FC 42XS
	ATTO	Celerity FC 44ES
	Emulex	LP11000
	Emulex	LPe11000
	LSI Logic	7104XP-LC
	LSI Logic	7204XP-LC
	Qlogic	QLA2460
	Qlogic	QLA2462
	Qlogic	QLA2462
	Qlogic	QLE2462
2Gb FC	Adaptec	9210LP
	Agilent	HHBA-5220A
	Agilent	HHBA-5420API
	ATTO	ExpressPCI 3300
	Cambex	FibreQuick PC2000
	Emulex	9002LP
	Emulex	952L
	Emulex	LP9402 DC-F2
	Emulex	LP9802-F2
	Emulex	LP982-F2
	JNI	FCE 6460-N
	JNI	FCX 6562-N
	JNI	FCX2 6562-N
	LSI Logic	449290
	Qlogic	2300
	Qlogic	2310
	Qlogic	2340
	Qlogic	2342
	VMIC	VMIPCI-5720

Ultrastar 15K300 compatibility: SAS & SCSI distribution HBAs

	Manufacturer	Product reference
SAS	Adaptec	48300
	Adaptec	4800SAS RAID
	Adaptec	4805SAS RAID
	Adaptec	AIC-9410
	LSI Logic	1064
	LSI Logic	1068
	LSI Logic	1064E
	LSI Logic	1068E
	LSI Logic	3041X
	LSI Logic	3080X-R
	LSI Logic	3442X
	LSI Logic	3442X-R
	LSI Logic	3800X
	LSI Logic	MegaRAID 8408E
	LSI Logic	MegaRAID 8480E
SCSI	Adaptec	2100s
	Adaptec	2120s
	Adaptec	2200s
	Adaptec	29160
	Adaptec	29320
	Adaptec	3200s
	Adaptec	39160
	Adaptec	39320
	Adaptec	39320DLT
	Adaptec	7902
	Adaptec	AIC-9410
	Adaptec	Onboard 7899
	Adaptec	Onboard 7902
	AIC	7899 U160
	ATTO	UL3D
	Intel	SROMBU42E
	Intel	SRCU42E
	Intel	SRCU42L
	Intel	SRCZCRX
	Lenovo	SureSCSI320/LSI 53C
	LSI Logic	1030 onboard
	LSI Logic	20160
	LSI Logic	20320
	LSI Logic	20320-R
	LSI Logic	21320
	LSI Logic	MegaRAID Elite 1600
	LSI Logic	MegaRAID SCSI 320-0
	LSI Logic	MegaRAID SCSI 320-1
	LSI Logic	MegaRAID SCSI 320-2
	Mylex	AcceleRAID 170

Ultrastar 15K300 compatibility: FC & SAS distribution enclosures

	Manufacturer	Product reference
1Gb FC	Ciprico	FibreStore
	Eurologic	XL-500
	IBM	Pro-Fibre Oyster
	JMR	15-bay 1Gb
2Gb FC	Adgile Systems	Leopard
	Eurologic	SANBloc2
	IBM	FastT700
	IBM	DF4000J
	JMR	FR15GF22-2S-2
	RAIDtec	FibreArray-2002
	Xyratex	RS1600-FC2
4Gb FC	IBM	EXP810
	Xyratex	RS-1600-2-F4
SAS	AIC	XJ-SA24-316R-B
	JMR	Marlin
	Promise	J300S
	Xtore	XJ-SA12-316R-S
	Xtore	XJ-SA24-316R-S
	Xyratex	RS-1603-E3-EBD

Ultrastar 15K300: SAS & SCSI distribution servers

	Manufacturer	Product reference
SAS	AIC	X6DA3-G2/RMC3E2-XPSA Single
	AIC	X6DA3-G2/RMC3E2-XPSAD Dual
	Supermicro	SuperServer 6024H-32
	Supermicro	SuperServer 7044H-32R
	Intel	S5000PAL/SR2500ALLXSPP
	Intel	S5000PSL/SC5400LXSPP
	Lenovo	R510
	Lenovo	T/R280
	NEC	Express5800 120Li
SCSI	Altos	G710
	Celestica	A8440
	Gateway	960
	Gateway	980
	Getek	G2U
	Intel	SE7221BA1-E/SC5250-E
	Intel	SE7221BK1-E/SR1425BK1 (SCSI)
	Intel	SE7520AF2 / SC5300LX
	Intel	SE7520BD2/SC5300LX
	Intel	SE7520JR2/SR1450
	Intel	SE7520JR2/SR2400
	Intel	SR4850HW4
	Intel	SR870BH2
	Intel	SR870BN4
	Intel	TIGPR2U
	Lenovo	R520
	NEC	Express5800
	Supermicro	P4DP8-G2
	Supermicro	X5DP8-G2

Ultrastar 15K300 compatibility: distribution operating systems

Operating system	
Novell Netware 6.0	SuSE 9.0 SP3 x86 Enterprise Server
Novell Netware 6.5	Suse 9.0 x64 Enterprise Server
Red Hat 9.0	SuSE 9.1 Professional
Red Hat Advanced Server 3.3	SUSE Enterprise Server 10 IA64 Update 3
Red Hat Advanced Server 3.3 64 bit	SUSE Enterprise Server 10 x86
Red Hat AS 4.0	SUSE Enterprise Server 9.0
Red Hat EL 4.0	SuSE Enterprise Server 9.0 SP3 x64
Red Hat Enterprise Linux AS 3.0 Update 1	SUSE Enterprise Server 9.1
Red Hat ES 3.0	Unixware 7.1.1
Red Hat ES 4.0 EM64t	Windows 2000 Advanced Server
Red Hat ES 4.0 iA64	Windows 2003 Enterprise 32bit
RedHat AS 3.0 AMD_64 QU7	Windows 2003 Enterprise 64bit
RedHat AS 3.0 QU1	Windows 2003 Enterprise IA64
RedHat AS 3.0 QU3	Windows 2003 Server Standard R2 x64
RedHat AS 3.0 QU5	Windows 2003 Server Standard R2 x86
RedHat AS 4.0 AMD_64	Windows 2003 Server Std. R2 x64
RedHat AS 4.0 AMD_64 QU2	Windows 2003 Server Std. R2 x86
RedHat AS 4.0 AMD_64 QU3	Windows 2003 Standard
RedHat AS 4.0 AMD_64 QU4	Windows Longhorn Server x64 Build 5600
RedHat AS 4.0 IA64 QU4	Windows Longhorn Server x86 Build 5600
RedHat AS 4.0 x86 QU2	Windows NT 4.0
RedHat AS 4.0 x86 QU4	Windows Vista Beta 2 IA64 Server
RedHat ES 3.0 AMD_64	Windows Vista Beta 2 x64 Server
RedHat ES 3.0 AMD_64 QU4	Windows Vista x86 Server Beta 2
SuSE 9.0 Enterprise Server	Windows XP Pro
SuSE 9.0 SP2 x86 Enterprise Server	Windows XP Pro x64
SuSE 9.0 SP3 x64 Enterprise Server	

To find out more about the Hitachi Ultrastar 15K300, or how our Design Studios could help you, visit **www.hitachigst.com**

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